

Notice of Allowability

Application No.

10/803,910

Applicant(s)

HIGAKI ET AL.

Examiner

Kaushikkumar Patel

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4/28/2006.
2. ☒ The allowed claim(s) is/are 21-36.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 5/18/2006
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on May 18, 2006 have considered by the examiner. Some of NPL documents were not considered due to poor quality of documents, which were unreadable.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in an email conversation with Juan Carlos A. Marquez (Reg. # 34072) on July 11, 2006.

3. The application has been amended as follows:

In the claims, please amend the claims as follows:

Claim 21. (Currently amended): A storage control device, comprising:

a channel adapter, which is operatively coupled to a computer, provides upper logical volumes for the computer and receives data sent from the computer to the upper logical volumes;

a memory, which is operatively coupled to the channel adapter and stores the data sent from the computer and configuration information with respect to a configuration of the storage control device;

a disk adapter which is operatively coupled to the channel adapter and the memory, controls reading and writing of the data from/to the memory and provides inner logical volumes at least one of which is mapped to a one of the upper logical volumes, the inner logical volumes being used as storing regions for transmission and reception of the data between the channel adapter and the disk adapter; and

a plurality of disk drives, which are operatively coupled to the disk adapter, in which the data sent from the computer are written by control of the disk adapter as a data group,

wherein a first inner logical volume of the inner logical volumes is mapped to a first upper logical volume of the upper logical volumes and is mapped to a first set of disk drives in the plurality of disk drives, a first data group targeted to the first inner logical volume is written into the first set of disk drives,

wherein a second upper logical volume of the upper logical volumes is used by the computer for controlling the storage control device and is utilized when the configuration information in the memory is read by the computer,

wherein the channel adapter receives a command including a change-over instruction, which includes information identifying a second inner logical volume of the inner logical volumes, from the computer sent for the second upper logical volume, and

wherein the channel adapter maps the second inner logical volume instead of the first inner logical volume to the first upper logical volume in response to the change-over instruction issued from the computer to the second upper logical volume and operates to start a second set of disk drives in the plurality of disk drives mapped to the second inner logical volume.

Claim 26. (Currently amended): The storage control device as set forth in claim 21, wherein ~~in the case~~ a second command sent from the computer to the second upper logical volume is a write command, the channel adapter judges that a content of the write command includes the change-over instruction.

Claim 27. (Currently amended): The storage control device as set forth in claim 21, wherein ~~in case~~ a second command sent from the computer to the second upper logical volume is a read command, the channel adapter judges that an object of the read command is the configuration information, reads the configuration information from the memory, and sends the configuration information to the computer.

Claim 29. (Currently amended): The storage control device as set forth in claim 21, wherein ~~in the case that~~ a second command sent from the computer is addressed to the first upper logical volume, the channel adapter judges that the second command sent from the computer is a command concerning writing or reading of the data, and ~~in the case that~~ if the second command sent from the computer is addressed to the second upper logical volume, the channel adapter judges that the second command sent from the computer is a command concerning the control information.

Claim 31. (Currently amended): A storage system coupled to a computer, comprising:

an interface coupled to the computer;

a plurality of disk drives;

a plurality of upper volumes for the computer; and

a plurality of inner volumes which are mapped to the plurality of disk drives,

wherein a first upper volume of the plurality of upper volume is mapped to a first inner volume of the plurality of inner volumes so as to access the first inner volume by the computer,

wherein a second upper volume of the plurality of upper volumes is used by the computer for controlling the storage system;

wherein, in response to receiving an access command at the interface from the computer for accessing the first upper volume of the plurality of upper volumes, the first inner volume mapped to the first upper volume is accessed by the computer via the first upper volume, and

wherein the first upper volume is mapped to a second inner volume of the plurality of inner volumes instead of the first inner volume in response to receiving an instruction from the computer for the second upper volume to assign the second inner volume to the first upper volume such that the second inner volume is accessed by the computer via the first upper volume in response to receiving the access command at the interface for accessing the first upper volume.

Claim 35. (Currently amended): A storage system according to claim 34, ~~further comprising a command device for receiving instructions from the computer as read/write commands 31, wherein the second upper volume receives the instruction is received at the command device as a write command.~~

4. Claims 21-36 are allowed.

5. The following is an examiner's statement of reasons for allowance:

As per independent claims 21 and 31, the prior art of record fails to teach or suggest a logical volume (a second upper logical volume as in claims) dedicated as a means of communicating control information of the storage device, which has the beneficial effect of reducing the complexity of the storage system and same data structure (i.e. logical volumes) is used to realize the communication as well as the storage.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaushikkumar Patel whose telephone number is 571-272-5536. The examiner can normally be reached on 8.00 am - 4.30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


kmp

Kaushikkumar Patel
Examiner
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7/17/06

MANO PADMANABHAN
SUPERVISORY PATENT EXAMINER